

REMARKS

Reconsideration and allowance of this application are respectfully requested in light of the above amendments and the following remarks.

The specification has been amended to include section headings. No new matter is believed to be introduced by the amendments.

Claims 1-23 have been canceled in favor of new claims 24-47. Support for the subject matter of the new claims is provided in original claims 1-23. New claims 24-47 have been drafted to avoid the issue underlying the objections to claims 5-16.

Claims 1, 4, 17-19, and 21 were rejected, under 35 USC §102(e), as being anticipated by Onggosanusi et al. (US 2003/0048857). Claims 1, 4, 17-19, 21, and 22 were rejected, under 35 USC §102(e), as being anticipated by Riazi et al. (US 6,580,705). Claims 1-3, 17, and 19-23 were rejected, under 35 USC §102(e), as being anticipated by Lundby et al. (US 6,356,528). To the extent these rejections may be deemed applicable to new claims 24-47, the Applicants respectfully traverse.

Independent claims 24, 40, and 44 each recite ARQ re-transmission of data in a wireless communication system. It

is submitted that the applied references fail to anticipate this feature.

Onggosanusi discloses a space-time transmitter diversity system with diversity encoded parallel streams (see Onggosanusi Fig. 3 and paragraph [0110]). In paragraph [0100] of Onggosanusi's specification, the asymmetric modulation for the two data streams is described in further detail. In fact, an upper symbol mapper maps a set of two bits into a QPSK symbol and a lower mapper maps a set of four bits into a 16-QAM symbol. Analogously, as shown in Onggosanusi's Fig. 4 and described in paragraphs [0111]-[0116], a receiver uses appropriate symbol constellations which may be dynamically adapted for demodulation.

However, the Applicants note that the system is not described in the context of an ARQ retransmission system in a wireless communication system wherein data packets are transmitted in a first transmission and the same data packets are retransmitted in a second transmission based on a repeat request. Rather, the symbols are separated between an upper and a lower mapper, that is, the data stream is separated in an asymmetric manner. Thus, Onggosanusi reflects only the known transmit diversity techniques, wherein data is transmitted by default without explicit request in a feedback channel as done in an ARQ scheme by requesting retransmission. The Applicants note that

such known diversity techniques were acknowledged on page 1 of the description of the present application.

Riazi relates to a wireless transmission system wherein the same information is transmitted in parallel using two or more different types of modulation schemes, that is, two TDM signals and a single OFDM signal (see Riazi abstract and Fig. 1). At the receiver side, a respective combining block combines the three data streams after transmission over diversity branches (col. 3, line 32, through col. 4, line 15, and col. 5, lines 4-15).

As is the case with Onggosanusi, Riazi does not relate to an ARQ transmission system and method, but rather discloses a multi-code diversity system wherein identical data is transmitted in parallel diversity branches. Hence, Riazi also merely reflects the known diversity techniques which have been acknowledged in the introductory portion of the description of the present application.

Lundby relates to a diversity transmission communication system wherein a data stream is separated by a de-multiplexer 104 (see Lundby Fig. 2) into two diversity streams using different Walsh spreaders 112, 114. One diversity branch additionally uses a shuffler 110 to cyclically rotate a group of four sequential symbols to a different sequence. Other shuffling functions, such as reversing or flipping, are mentioned too (see col. 7, lines

1-10). Furthermore, additional embodiments mention frequency or time diversity (see col. 7, lines 27-45).

However, the Applicants again emphasize that Lundby does not disclose an ARQ system wherein the same data is re-transmitted upon request. As already mentioned above, frequency, time or code diversity has been known in the art wherein diversity branches transmit data streams by default. However, the invention is based on the idea of applying diversity to an ARQ transmission system and receiver.

In conclusion, the Applicants note that the three applied references do not relate to an ARQ transmission system, whereas the present invention pertains to such system.

Accordingly, the Applicants submit that none of the applied references anticipates the subject matter defined by independent claims 24, 40, and 44.

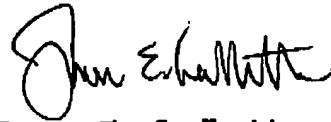
Therefore, allowance of claims 24, 40, and 44 and all claims dependent therefrom is warranted.

In view of the above, the Applicants respectfully submit that this application is in condition for allowance, and a notice to that effect is respectfully solicited.

If any issues remain which may best be resolved through a telephone communication, the Examiner is requested to telephone

the undersigned at the local Washington, D.C. telephone number listed below.

Respectfully submitted,



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JEL/DWW/att

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